

AUSTRALASIAN CERATOPOGONIDAE (DIPTERA, NEMATOCERA)
PART XI:¹ THE AUSTRALIAN SPECIES OF *PELLUCIDOMYIA*
MACFIE, AND A DESCRIPTION OF THE MALE GENERIC
CHARACTERS

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(Text Figures 1-18)

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Synopsis

In the present paper the previously undescribed male generic characters of *Pellucidomyia* are incorporated into the generic diagnosis. In addition, a new Australian species is described and the description of the only previously known Australian species (*Pellucidomyia leei* Wirth) is supplemented.

Genus *PELLUCIDOMYIA* Macfie

Pellucidomyia Macfie, 1939, Ruwenzori Exped., 1934-5, vol. 1, no. 5, Ceratopogonidae, p. 99. (Type: *Pellucidomyia ugandae* Macfie, monobasic.)

Macfiehelea Lane, 1946, *Rev. de. Ent.* 17: 208. (Type: *Macfiehelea oliveirai* Lane, monobasic.)

Diagnosis (based on Wirth, 1960):

Body densely white or blackish pollinose above. Head flattened antero-posteriorly, the unflattened portion with the same pollinosity as scutum; eyes bare, broadly separated; female with distal five, male with distal three, antennal segments markedly elongate, female antennal segments with sparse basal verticels, male with sparse antennal plume; palp 5-segmented, third segment not swollen, without sensory pit. Scutum conically produced anteriorly, without or with only a small, blunt anterior tubercule. Legs slender, femora unarmed, slightly club-shaped distally; fore legs short, mid legs longer, hind legs of female extremely elongated, of male only slightly elongated; in both sexes fore and mid fourth tarsal segment cordate to transverse, hind fourth tarsal segment cylindrical, very long and slender in female; fifth tarsal segment unarmed, inflated on fore leg, but not on mid and hind legs. Claws of female equal and simple or with a minute basal tooth on fore and mid legs; single, long, and with or without a basal barb on hind legs; claws of male equal on all legs. Wing venation similar to that of *Bezzia*; one radial cell; costa extending almost to wing tip; microtrichia absent or very small; macrotrichia absent. Abdomen of female without gland rods, with a pair of hair tufts ventrally on eighth segment; two large, and also sometimes one vestigial, spermathecae. Male genitalia: ninth tergite short and broad; aedeagus arched, expanded and setose medially, and with long anterior processes which articulate with the bases of the coxites; parameres broadly fused apically.

Australian species of Pellucidomyia

Most specimens were mounted in balsam on microscope slides. All measurements are based on slide specimens only, and are given in millimetres. Wing length is measured from the basal arcus. Morphological terms used are largely adopted from Wirth, 1952.

¹Part X appeared in Vol. lxxxvii, p. 352.

Abbreviations: USNM = United States National Museum, Washington; SPHTM = School of Public Health and Tropical Medicine, Sydney.

Key to Australian Species of Pellucidomyia

- 1. Legs largely whitish or yellowish, with dark brown bands leei Wirth
- Legs largely dark brown, all tibiae with a pale sub-basal band dycei n. sp.

PELLUCIDOMYIA LEEI Wirth

Pellucidomyia leei Wirth, 1960, *Bull. Brooklyn ent. Soc.*, 55 (1): 2-3.
This species was described from two females from Hartley's Creek, north of Cairns, Qld., 24.iv.1957. Here the description of the female is supplemented and the male and pupal characters newly noted, from a series of 14 females and 10 males from various localities in Queensland, New South Wales and Victoria.

Types: Holotype ♀ in USNM; 1 ♀ paratype in SPHTM.

Type Locality: Hartley's Creek, north of Cairns, Qld. (24.iv.1957, W. W. Wirth).

Female: Length 2.5-3.1 mm. (average 2.8 mm.), wing length 1.7-2.3 mm. (average 2.1 mm.), wing breadth approximately 1/3 wing length.

Eyes bare. Proboscis short, just under 1/3 the length of the head. Mandibular teeth 11-12. Palp dark brown, segment III not swollen, with 3 long sensillae on inner aspect of apical half. Palpal ratio 3.0. (Fig. 1.)

Palpal segment ..	I	II	III	IV	V
Length	0.019	0.038	0.057	0.041	0.049

Antennal segment II dark brown, yellow dorsally, segments III-IV dark brown, IV often paler basally, segments V-X brownish-white on basal half, brown on apical half, segments XI-XV brown, XI-XII with bases paler.

Antennal segment ..	III	IV	V	VI	VII	VIII	IX	X
Length	0.012	0.057	0.057	0.057	0.053	0.053	0.057	0.053

XI	XII	XIII	XIV	XV
0.182	0.186	0.182	0.197	0.228

Scutum without, or with a small, blunt, anterior tubercle. Fore femur yellowish, slightly brownish to dark brown distally, fore tibia whitish to yellowish, apex and sub-basal 1/3 brownish, mid femur yellowish, basal half and apex brown, tibia whitish to yellowish, basal fourth and apex light brown, hind leg whitish to yellowish, femur with base brown, proximal half brown dorsally, apical fourth dark brown to blackish, tibia with base narrowly and apex broadly dark brown, sometimes also with a broad pale brown sub-basal band. Fore tarsi pale brown, except V which is dark brown, mid tarsi whitish with apices pale brown, except IV-V, which are brown, hind tarsal segment I whitish with apex broadly light brown, II light brown, apex darker, III-IV brown, V pale brown, base and apex darker. (Figs 5, 7.)

		Tarsus						
Leg segment :	Femur	Tibia	I	II	III	IV	V	Tarsal Ratio
Length : Fore	0.735	0.540	0.197	0.079	0.068	0.076	0.152	2.48
Mid	1.185	0.825	0.380	0.148	0.076	0.064	0.121	2.56
Hind	1.260	1.305	1.080	1.125	0.525	0.390	0.285	0.96

Claws of fore and mid legs paired, equal, with a minute internal basal tooth, in fore leg claws 1/2 as long as tarsal segment V, claws of mid leg slightly shorter than tarsus V. Claw of hind leg single, with a bifid basal tooth, claw as long as fifth tarsal segment.

Wing (Fig. 14) with microtrichia not visible; costal and radial veins pale yellowish, rest whitish, difficult to distinguish. No fringe on alula. Costal ratio 0.93. Haltere brown, apical half of club black.

Abdomen with tergites and sternites brown, terminal segments darker, pleural membranes greyish to light brown. Spermathecae (Fig. 11) three, two large, oval, without chitinised necks, 0.076×0.068 mm. and 0.072×0.053 mm., and one vestigial, oval to nearly tubular, 0.019×0.007 mm.

Male (description based on a selected specimen from the Merricumbene Cr.—Moruya R. series): Length 1.8 mm. (range 1.4–2.0 mm.), wing length 1.3 mm. (1.1–1.3 mm.), wing breadth approximately $\frac{1}{3}$ wing length.

The male differs from the female as follows:

Palpal ratio 2.0 (Fig. 2.)

<i>Papal segment</i> ..	I	II	III	IV	V
<i>Length</i>	0.015	0.026	0.038	0.026	0.030

Antenna (Figs 3–4) with segment II entirely dark brown, segments III–V brown, segments VI–XII brownish-white on basal half, brown on apical half, XIII–XV brown, XIII with base paler, antennal plume brown, sparse, reaching apex of segment XIII.

<i>Antennal segment</i> ..	III	IV	V	VI	VII	VIII	IX	X
<i>Length</i>	0.087	0.053	0.049	0.049	0.045	0.045	0.045	0.045
		XI	XII	XIII	XIV	XV		
		0.057	0.079	0.121	0.182	0.197		

Coloration of thorax and legs as in female, except mid femur may be brownish-white to light brown instead of yellowish. Hind leg not excessively elongated (Fig. 6).

			<i>Tarsus</i>					<i>Tarsal Ratio</i>
<i>Leg segment:</i>	<i>Femur</i>	<i>Tibia</i>	I	II	III	IV	V	
<i>Length: Fore</i>	0.465	0.360	0.148	0.072	0.060	0.053	0.114	2.05
<i>Mid</i>	0.645	0.465	0.239	0.098	0.064	0.041	0.091	2.42
<i>Hind</i>	0.630	0.615	0.502	0.277	0.172	0.105	0.112	1.81

Claws all paired, equal, approximately $\frac{1}{2}$ the length of the fifth tarsal segment, each with minute internal basal tooth.

Wing with microtrichia apparent at magnification $\times 100$. Costal and radial veins light brown, other veins very pale. Anterior edge of wing slightly fuscous. Costal ratio 0.80.

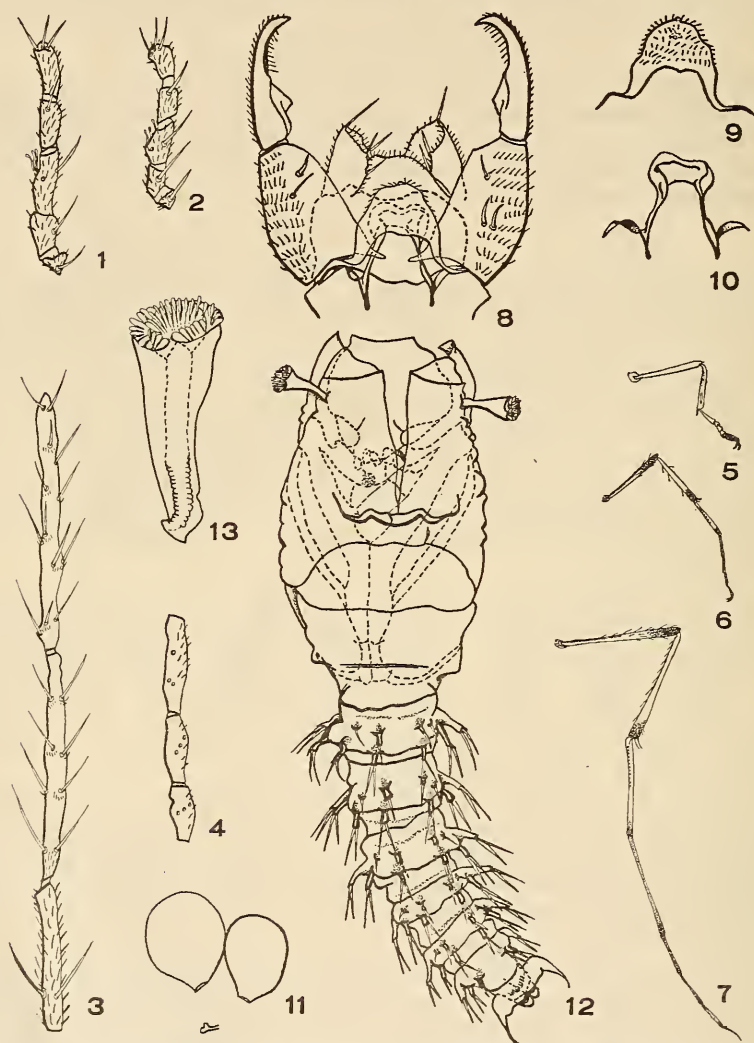
Abdomen blackish-brown. Hypopygium (Figs 8–10) including styles, brown. Aedeagus with an internal hook-like process just below apex. Ninth tergite broadly indented.

Pupa as illustrated (Figs 12–13). Thorax exceptionally bulbous, somewhat chironomid-like. Respiratory organ very short, funnel-shaped. Abdominal segments 3–7 similarly bristled, the tubercles arranged on each segment as follows: dorsally, two rows, the anterior row consisting of four tubercles, two on either side of the midline, the external ones smaller, and the posterior row consisting of four tubercles of approximately equal size, the inner pair directly beneath the inner pair of the anterior row, the external pair more lateral than the external pair of the anterior row; laterally, a single posterior row of three large tubercles, the most dorsal one being the largest; ventrally, a single row of six tubercles, three on either side of the midline, the outer one smallest. Glandular discs absent.

Distribution: Eastern Australia.

Specimens examined: Queensland—2 ♀ ♀, (in alcohol), Gillies Highway, 2m. W. of Little Mulgrave, 18.iv.1967, D. H. Colless; 2 ♀ ♀, Bramston Beach, nr. Innisfail, 30.iv.1967, rainforest fringe, D. H. Colless; 3 ♀ ♀, Innisfail

(1 Eubenangee Swamp, 12.xi.1963, 1 Morans Creek, 18.vi.1963, 1 Nino's Creek, mangrove swamp, 18.vi.1963), light trap, H. A. Standfast; 1 ♂, Ferny Grove, Brisbane, 23.xii.1954, net on creek bank, E. J. Reye. New South Wales—1 ♀, Bruxner Park, Coffs Harbour, 1.xi.1965, M. Upton; 2 ♀ ♀, Upper



Figs 1-13. *Pellucidomyia leei*, Wirth. 1, ♀ maxillary palp $\times 165$; 2, ♂ maxillary palp, $\times 165$; 3, ♂ antennal segments XIII-XV, $\times 165$; 4, ♂ antennal segments X-XII, $\times 165$; 5, ♀ fore leg, $\times 12$; 6, ♂ hind leg, $\times 12$; 7, ♀ hind leg, $\times 12$; 8, ♂ hypogium $\times 165$; 9, ♂ aedeagus $\times 165$; 10, ♂ parameres, $\times 165$; 11, ♀ spermathecae $\times 165$; 12, pupal case (dorsal view), $\times 40$; 13, pupal respiratory organ, $\times 165$.

Kangaroo Valley, 23.xi.1960, D. H. Colless; 1 ♀, Kangaroo Valley, 23.iii.1961, D. H. Colless; 8 ♂ ♂, 1 ♀, bred from pupae, Moruya River-Merricumbene Creek, 2.iii.1964, A. L. Dyce and M. D. Murray; 1 ♀, Merricumbene Creek, 1.iii.1964, light trap, A. L. Dyce. Victoria—1 ♂, 1 ♀ (in alcohol), bred from pupae, Cabbage Tree Creek, 22.xi.1965, A. L. Dyce and M. D. Murray.

The pupae of this species can be collected in widely differing habitats. Those of the Moruya River-Merricumbene Creek series were obtained about

1 mile up from the entry of the Merricumbene Creek into the Moruya River, in a temporary backwater formed in a sandy stretch of the river by leaf litter. In this situation they were protected by overhanging *Casuarina*, but were still exposed to sunlight for part of the day. They are floating pupae, and occur at the sand-water interface, being taken in samples from fairly coarse sand, algae and leaf litter. Other species taken in the same situation were *Culicoides bundyensis* Lee and Reye, *Culicoides victoriae* Macfie and *Culicoides dycei* Lee and Reye.

The pupae from Cabbage Tree Creek, on the other hand, were taken from a slow-running, deep-sided timbered creek which was almost completely shaded. The pupae were floated out from the organic mix at the creek margin. No other Ceratopogonidae were taken with these specimens.

PELLUCIDOMYIA DYCEI n. sp.

A large species with the legs almost entirely dark brown, very similar to *Pellucidomyia oliveirai* (Lane) from Brazil. Male unknown.

Types: Holotype ♀ and one ♀ paratype, in SPHTM.

Type Locality: Texas Station, Queensland (20.i.1952, suction light trap, A. L. Dyce).

Female: Length 2.68 mm., wing 1.60×0.54 mm. Body whitish pollinose. Head dark brown. Proboscis short, just over $\frac{1}{3}$ as long as the head. Mandible with approximately 7 large and several small teeth. Palp brown, segment III not swollen, bearing 2-3 long sensillae on inner surface of apical half. Palpal ratio 2.2.

<i>Palpal segment</i> ..	I	II	III	IV	V
<i>Length</i> ..	0.019	0.030	0.041	0.030	0.041

Antenna with segments II-IV dark brown, V-X whitish on basal half, light brown on apical half, segments XI-XV brown (Figs 16-17).

<i>Antennal segment</i> ..	III	IV	V	VI	VII	VIII	IX	X
<i>Length</i> ..	0.087	0.045	0.038	0.038	0.038	0.038	0.038	0.045
		XI	XII	XIII	XIV	XV		
		0.121	0.117	0.117	0.110	0.114		

Thorax entirely dark brown, scutum with a very small, blunt anterior tubercle. All coxae and trochanters brown, femora dark brown, paler at base, tibiae dark brown, fore and mid tibiae with a narrow yellowish sub-basal band, hind tibia with a broader white sub-basal band. Tarsi whitish, in fore leg the apices of segments I-IV slightly brownish, segment V entirely dark brown, in mid leg segments I-IV with apices brownish, V entirely pale brown, in hind leg I with apex broadly brown, II-V light brown, each segment slightly darker than the preceding one, all with apices broadly darker brown. Fore tibia with a pale apical spine. Hind tibia slightly curved, with an apical comb of 2 long and 2-3 shorter spines.

<i>Leg segment :</i>		<i>Femur</i>		<i>Tibia</i>		<i>Tarsus</i>					<i>Tarsal Ratio</i>
						I	II	III	IV	V	
<i>Length :</i>	<i>Fore</i>	0.615	0.435	0.174	0.087	0.064	0.060	0.152	2.00		
	<i>Mid</i>	0.930	0.530	0.338	0.114	0.079	0.057	0.095	2.97		
	<i>Hind</i>	1.065	1.050	0.975	1.005	0.465	0.360	0.240	0.97		

Claws of fore and mid legs equal, those of fore leg $\frac{1}{2}$ as long as fifth tarsal segment, those of mid leg equal to fifth tarsal segment, claw of hind leg long (as long as the fifth tarsal segment), single, with a small bifurcate basal barb.

Wing (Fig. 15) very pale, veins whitish, difficult to distinguish. Costa almost reaching wing tip, costal ratio 0.93; length of radial cell 0.82 mm. Haltere dark brown, knob blackish.

Abdomen brown, pleural membranes pale blackish-brown. Cerci brown. Spermathecae (Fig. 18) three, two dark brown, large, elongate oval, with very short and narrow chitinised necks, 0.110×0.072 mm. and 0.102×0.060 mm., and one vestigial, oval, 0.011×0.009 mm., with a relatively long chitinised neck, 0.011 mm.

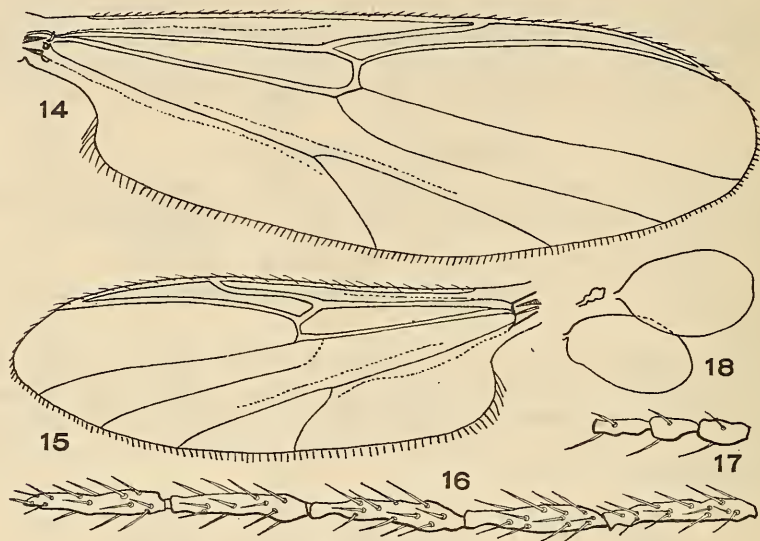


Fig. 14. *Pellucidomyia leei*, Wirth. ♀ wing, ♂ 40.

Figs 15-18. *Pellucidomyia dycei*, n. sp. 15, ♀ wing, $\times 40$; 16, ♀ antennal segments XI-XV, $\times 165$; 17, ♀ antennal segments VIII-X, $\times 165$; 18, ♀ spermathecae, $\times 165$.

Distribution: Known only from the type locality. Both specimens were collected on the north bank of the Dumaresq River, which is an open river with a sandy bottom. The light trap was suspended over water trapped in a root hole of a tree which had fallen across the river. This water was stagnant and partly shaded.

This species can be distinguished from *P. oliveirai* by the dark brown fifth tarsal segment of the fore leg, the colour of the abdomen, *oliveirai* having segments III-VII mostly white, and the much smaller wing in relation to body length (wing 2 mm., body 2.2 mm in *oliveirai*). The female can further be distinguished by the larger hind tarsal ratio, 0.97 compared to 0.7 in *oliveirai*.

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